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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,625	08/01/2003	Akira Terao	SPRCP012	4753

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EXAMINER

FICK, ANTHONY D

ART UNIT PAPER NUMBER

1753

DATE MAILED: 12/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/632,625	Applicant(s) TERAO ET AL.	
	Examiner Anthony Fick	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>2/2/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 through 7, 10 through 18 and 20 through 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Stern et al. (U.S. 5,344,496).

Stern discloses a lightweight solar concentrator cell array as shown in figures 2, 3 and 4.

Regarding claim 1, figures 3 and 4 show a photovoltaic module comprising a plurality of radiation reflectors each comprising an asymmetric portion of a parabolic or similarly shaped surface, the plurality being serially arranged and a plurality of photovoltaic cells, 22. Figure 3 shows that each cell is shielded from direct radiation by an adjacent reflector and with the corresponding reflector directing off-axis radiation to the cell (dotted lines in figure 3).

Regarding claims 2 and 3, Stern discloses the reflectors are a formed material with a reflective surface, and the material itself is cured to be reflective (column 4, paragraph 3).

Regarding claims 4, 5, and 6, Stern further discloses the reflectors can include a reflective coating of aluminum or silver (column 4, paragraph 3).

Regarding claim 7, figure 2 shows the reflectors formed as one unit.

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Regarding claim 10, figure 3 shows the photovoltaic cells are located at or near the focus of the reflector (column 4, paragraph 1).

Regarding claim 11, the reflectors shown in figure 3 have an appendage, 26, that could allow mounting of a cell. Further, as Stern discloses attachment of the cells to the reflectors, the means of attachment, adhesives, bonding, etc., read on an appendage for mounting a cell.

Regarding claim 12, figures 1 and 2 show a radiation reflector array comprising a plurality of reflectors arranged in rows and columns each reflector comprising an asymmetric portion of a parabolic or similarly shaped surface. Figure 3 shows the reflectors direct radiation to or from a focus hidden behind an adjacent reflector with the radiation being off-axis with respect to the reflector.

Regarding claim 13, Stern discloses the reflectors are a formed material with a reflective surface, and the material itself is cured to be reflective (column 4, paragraph 3).

Regarding claims 14, 15, and 16, Stern further discloses the reflectors can include a reflective coating of aluminum or silver (column 4, paragraph 3).

Regarding claim 17, figure 2 shows the reflectors formed as one unit.

Regarding claim 18, figure 3 shows the radiation is transmitted to or from the focus of the reflector (column 4, paragraph 1):

Regarding claim 20, the reflectors shown in figure 3 have an appendage, 26, that could allow mounting of a receiver or transmitter. Further, as Stern discloses

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attachment of the cells to the reflectors, the means of attachment, adhesives, bonding, etc., read on an appendage for mounting a receiver or transmitter.

Regarding claim 21, figures 3 and 4 show a radiation reflector comprising an asymmetric portion of a parabolic or similarly shaped surface. Figure 3 shows the reflector directing off-axis radiation to or from the focus of the surface (dotted lines in figure 3).

Regarding claim 25, Stern discloses the reflectors are a formed material with a reflective surface, and the material itself is cured to be reflective (column 4, paragraph 3).

Regarding claims 22, 23 and 24, Stern further discloses the reflectors can include a reflective coating of aluminum or silver (column 4, paragraph 3).

Regarding claim 26, the reflector shown in figure 3 has an appendage, 26, that could allow mounting of a receiver or transmitter. Further, as Stern discloses attachment of the cells to the reflectors, the means of attachment, adhesives, bonding, etc., read on an appendage for mounting a receiver or transmitter.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8, 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stern as applied to claims 1 through 7, 10 through 18 and 20 through 26 above,

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and further in view of Terao et al. (A Mirror-less Design for Micro-Concentrator Modules, Proceedings of the 28th IEEE Photovoltaic Specialists Conference, Anchorage, Alaska, 2000, pgs 1416-1419).

The disclosure of Stern is as stated above for claims 1 through 7, 10 through 18 and 20 through 26.

The difference between Stern and the claims is the requirement for a secondary reflector or refractor with each cell.

The work of Terao et al. teaches a concentrator photovoltaic system. Figures 1 and 2 show the use of refractors and secondary reflectors to concentrate the light beams onto a solar cell.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the refractors and secondary reflectors of Terao et al. within the device of Stern because the use of refractors and secondary reflectors produces a high concentration ratio with a reduced size and mechanical constraints on the module assembly (Terao et al, Introduction, paragraphs 2, 3 and 4). Because Stern and Terao et al. are concerned with solar concentrator systems, one would have a reasonable expectation of success from the combination. Thus the combination meets the claims.

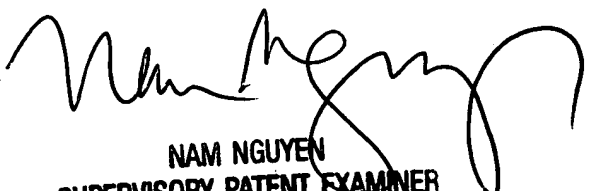
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday thru Friday 7 AM to 4 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Fick *ADF*
AU 1753
December 7, 2006


NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700